

**REMARKS:**

This paper is herewith filed in response to the Examiner's final Office Action mailed on September 30, 2009 for the above-captioned U.S. Patent Application. This office action is a final rejection of claims 1-4 and 9-11 of the application.

More specifically, the Examiner has rejected claims 1 and 4 under 35 USC 103(a) over Zhang (US 7,116,819) in combination with Matsuura (US6823090); rejected claims 2 and 9 under 35 USC 103(a) as being unpatentable over Zhang in combination with Matsuura and further in view of Okada (US6977683); rejected claims 3 and 10 under 35 USC 103(a) as being unpatentable over Zhang in combination with Matsuura and Okada and further in view of Juenger (US5778106); and rejected claim 11 under 35 USC 103(a) as being unpatentable over Zhang in combination with Matsuura and further in view of Kagle. The Applicants respectfully disagrees with the rejections.

Claims 1-4 and 9-11 have been amended. Support for the amendments may be found at least in Figures 3 and 9-10 and paragraphs [0048]-[0054] and [0095]-[0103] of the published application. No new matter is added.

The Applicants respectfully request that the Examiner enter and consider these amendments presented in the Response to final Office Action.

With regards to the Examiner's comments in the Response to Arguments section of the Office Action, the Applicants disagree.

The Applicants note that the exemplary embodiments of the invention relate to at least a method and apparatus to remove part or all of image processing that has been performed as part of an interpolation process. Thereafter, the data obtained by the removal process is operated on to perform another interpolation process that differs from the previous interpolation process, such as, for the reason that this additional interpolation process requires an increased (more

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complicated) amount of operational processing and memory (paragraphs [0049] to [0055] of the published application).

Regarding the rejection of claim 1 the Applicants submit that the references cited can not be seen to disclose or suggest at least where claim 1 recites in part:

“perform at least one process for input image data resulting from a first interpolation process, including removing at least part of an effect of the first interpolation process from the input image data; and prepare output data by performing a second, different, interpolation process for the image data obtained after the at least part of the effect of the first interpolation has been removed”

In the rejection, the references Zhang and Matsuura as combined in order to allegedly disclose or suggest claim 1. The Applicants disagree with the rejection.

The Examiner states:

“Matsuura teaches removal means, for performing an intermittent process for input image data resulting from an interpolation process, and removing, from the output image data, part or all of the steps of an interpolation process (Refer to Figure 3; also at column 3, line 66-column 4, line 3; Figure 1, numeral 101, 105, 106, Step S203 and 112, also at column 2, line 63 to column 3 to line 65, wherein the “X-ray generation circuit 101” in combination with the “Image Processing Circuit 112” work together to provide removal means for input image data (S201) from an interpolation process (numeral 120 and 121) for removing part or all of the interpolation process as described in the corresponding specification regarding for example “feature extraction”, numeral 118),” (see Office Action page 3).

Although the Applicants do not agree that the combination of Zhang and Matsuura is proper, the Applicants submit that Matsuura clearly can not be seen to disclose or suggest where claim 1 relates to performing at least one process for input image data resulting from a first interpolation process, including removing, from the input image data, at least part of an effect of the first interpolation process, as similarly asserted in the rejection.

With regards to steps 120 and 121 in Matsuura the Applicants note that Matsuura discloses:

“The threshold value processing circuit 120 sets appropriate threshold values for respective subbands, and executes threshold value processes of discrete wavelet coefficients using the set threshold values. The processing discrimination circuit 121 discriminates based on the threshold value processing results of the respective subbands if discrete wavelet coefficients of respective pixels are to be processed,” (col. 3, lines 51-68).

The Applicants note that, as stated above, in steps 120 and 121 Matsuura is setting appropriate thresholds for respective subbands and then discriminates based on the threshold values results of the respective subbands. The Applicants submit that the threshold value processes 120 and 121, as cited in the rejection, appear to be in conjunction with a pre-processing circuit 106 of Matsuura. According to Matsuura the pre-processing circuit 106 executes pre-processes such as an offset correction process, gain correction process, and the like for the signal (X-ray image signal) output from the data acquisition circuit 105, (col. 3, lines 38-41). The Applicants submit that Matsuura does not disclose or suggest that the pre-processing circuit performs an interpolation process. The Applicants contend that there can not be found any operation in Matsuura which can be seen to relate to at least one process for input image data resulting from a first interpolation process, as in claim 1.

In addition, as stated above in the rejection, the Examiner appears to argue that the feature extraction 118 of Matsuura is somehow reading upon an interpolation process removed from the image data as part of the threshold determination process of steps 120 and 121. However, the Applicants submit that this can not be seen to be the case for at least the reason that Matsuura discloses that the feature extraction circuit 118 is extracting a feature amount for the tone conversion circuit 119 to process a tone conversion in accordance with the extracted feature amount, (col. 3, lines 60-65). The Applicants contend that, with regards to the feature for the tone conversion, there can not be found in all of Matsuura where this operation of extracting a feature amount for the tone conversion circuit relates to removing features from an input image data. Rather, Matsuura as cited is merely seen to be acquiring a feature of the data for a tone conversion. Moreover, as similarly stated above, it is not agreed that this operation is even performed on input image data resulting from a first interpolation process.

Further, the Applicants note that in the arguments to support motivation for a person of ordinary skill in the art to combine Zhang and Matsuura, the Examiner refers to a “noise removal” process in Matsuura. The Applicants note that according to Matsuura, after the X-ray image is pre-processed the image then undergoes a noise removal process (col. 3, lines 42-47). First, the Applicants submit that, as previously argued, the pre-processing does not relate to an interpolation process. Moreover, the Applicants contend that the noise removal process of Matsuura can not be seen to relate to removing, from image data, at least part of an effect of a first interpolation process.

Matsuura discloses:

The coefficient conversion circuit 117 executes coefficient conversion of wavelet coefficients of the respective subbands, which correspond to the pixels to be processed determined in step S304 (step S305). As an example of the process in step S305, a well-known noise removal process called wavelet degeneration may be used. Wavelet degeneration is that coefficients of respective subbands are suppressed based on a given condition. [...] Finally, using the wavelet coefficients of the respective subbands that have been converted by the coefficient conversion circuit 117 in step S305, the discrete wavelet transformation circuit 116 computes the inverse discrete wavelet transforms to reclaim and output a noise-removed image (step S306),” (emphasis added), (col. 5, lines 12-41); and

“The discrete wavelet transformation and inverse discrete wavelet transformation of the discrete wavelet transformation circuit 116 are well-known transformation processes, and operate as follows. The discrete wavelet transformation circuit 116 executes a two-dimensional discrete wavelet transformation process for an input image signal, and computes and outputs transformation coefficients [and] The transformation coefficients stored in the main memory 109 are sequentially read out, undergo transformation, and are written again in the main memory 109 by the discrete wavelet transformation circuit 116,” (emphasis added), (col. 5, line 49 to col. 6, line 21).

According to Matsuura, as stated above, the noise removal process is performed by executing a two-dimensional discrete wavelet transformation process for an input image signal. Then the transformation coefficients stored in the main memory 109 are sequentially read out, undergo

transformation, and are written again in the main memory. The Applicants submit that the noise removal process of Matsuura is merely seen to operate on an input X-ray image signal which has been pre-processed for offset and gain correction. Moreover, the noise removal process of Matsuura is seen to be reclaiming a noise-removed image. Thus, the Applicants contend that this operation can not be seen to disclose or suggest where claim 1 relates to removing, from input image data, at least part of an effect of the first interpolation process.

In addition, the Applicants respectfully submit that none of the references cited can be seen to overcome the shortfalls of Zhang and Matsuura, as stated above.

Moreover, the Applicants note that to argue motivation for combining Zhang and Matsuura, the Examiner states:

“The motivation/suggestion for doing so would have been “to efficiently attain noise removal.” (Abstract, Matsuura). Further another motivation/suggestion to combine the teachings of Zhang and Matsuura to utilize an information terminal to processing image data would have been ‘changing an image and, more particularly, changing transformation coefficients upon frequency transformation...” (refer to column 1, lines 7-11, Matsuura)”

The Applicants disagree. The Applicants submit that there can not be seen motivation by one ordinary skill in the art to combine a reference which relates to an image processing apparatus for processing RGB image data for an image capturing element including a primary-color filter (Zhang, Abstract), with another reference which relates to a device for removing noise from an X-ray image (Matsuura, Abstract). The Applicants submit that this is seen to be the case for at least the reason that Matsuura fails to disclose any operation related to a primary color filter as in Zhang.

The applicants contend that, for at least the reasons stated, even if the references were combined, which is not agreed to as proper, the proposed combination would still fail to disclose or suggest claim 1. Thus, the rejection of claim 1 should be removed.

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Furthermore, the Applicants submit that, for at least the reason already stated, the references cited can not be seen to disclose or suggest at least where independent claim 4 recites in part:

“outputting the image data resulting from the interpolation processes, where performing the interpolation processes include: performing at least one process including removing, with at least one processor, at least part of an effect of a first interpolation process from the image data resulting from the first interpolation process; and performing a second, different, interpolation process for data obtained after the at least part of the effect of the first interpolation process has been removed”

Therefore, the rejection of claim 4 is seen to be improper and the rejection should be removed.

In addition, for at least the reason that claims 2-3 and 12 and claims 9-11 and 13 depend from claims 1 and 4, respectively, the references cited can not be seen to disclose or suggest these claims.

Based on the above explanations and arguments, it is clear that the references cited cannot be seen to disclose or suggest claims 1-4 and 9-13.

The Applicants respectfully request that, for at least the reasons stated, the Examiner reconsider and remove the final rejection of claims 1-4 and 9-11.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record. Should any unresolved issue remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

Respectfully submitted:

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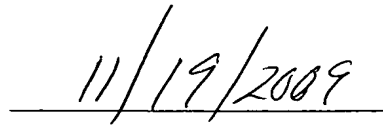
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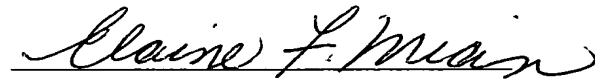
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